

DIRECT TESTIMONY AND EXHIBITS OF
OMARI R. THOMPSON
ON BEHALF OF
THE SOUTH CAROLINA OFFICE OF REGULATORY STAFF
DOCKET NO. 2022-1-E

1 **Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS AND OCCUPATION.**

2 A. My name is Omari R. Thompson. My business address is 1401 Main Street, Suite
3 900, Columbia, South Carolina 29201. I am employed by the South Carolina Office of
4 Regulatory Staff (“ORS”) in the Energy Operations Division as a Regulatory Analyst.

5 **Q. PLEASE STATE YOUR EDUCATIONAL BACKGROUND AND EXPERIENCE.**

6 A. I received my Bachelor of Science Degree with a major in Civil Engineering from
7 the University of South Carolina in 2004. From 2005 to 2016, I was employed as an
8 Environmental Engineering Associate at the South Carolina Department of Health and
9 Environmental Control initially in the Bureau of Water and eventually in the Bureau of Air
10 Quality. I worked in the Bureau of Water (2005-2010) reviewing engineering reports and
11 plans/specifications for industrial wastewater facilities. I determined National Pollutant
12 Discharge Elimination System (NPDES) permit conditions and prepared permits for
13 issuance. I also provided information to the public, industrial representatives, and
14 consultants regarding state laws and regulations. In the Bureau of Air Quality (2010-2016),
15 I wrote construction permits for air pollution sources with new, altered, or increased
16 emissions. I also wrote operating permits for air pollution sources that met all the
17 conditions as required by state and/or federal regulations. I further assisted with inspecting

air pollution sources for compliance with state and/or federal regulations and kept abreast of guidance and regulations affecting permitting in South Carolina. From 2016 to 2021, I was employed as an Engineering Associate with the South Carolina Department of Transportation. In that capacity, I assisted in preparing road plans for design field review, right of way, and eventually construction. I also assisted in reviewing survey data, preparing horizontal alignments for various roadway types, and plotting original topography, existing cross sections and profiles. I began my employment with ORS as a Regulatory Analyst in June 2021.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE PUBLIC SERVICE COMMISSION OF SOUTH CAROLINA (“COMMISSION”)?

A. No, this is my first time testifying before the Commission.

Q. WHAT IS THE MISSION OF THE OFFICE OF REGULATORY STAFF?

A. ORS represents the public interest as defined by the South Carolina General Assembly in S. C. Code Ann. § 58-4-10 as:

[T]he concerns of the using and consuming public with respect to public utility services, regardless of the class of customer, and preservation of continued investment in and maintenance of utility facilities so as to provide reliable and high-quality utility services.

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY AND HOW DOES YOUR DIRECT TESTIMONY REPRESENT THE PUBLIC INTEREST?

A. The purpose of my direct testimony is to set forth ORS’s recommendations resulting from ORS’s examination and review of Duke Energy Progress, LLC’s (“DEP” or the “Company”) power plant operations in the generation of electricity to meet the Company’s South Carolina retail customer requirements during the review period. The review period includes the actual data for March 2021 through February 2022 (“Actual

Period”), estimated data for March 2022 through June 2022 (“Estimated Period”), and forecasted data for July 2022 through June 2023 (“Forecasted Period”). My review focused on ensuring the Company efficiently operated its plants and made every reasonable effort to minimize fuel costs so as to provide reliable and high-quality service to its customers.

Q. WAS THE REVIEW PERFORMED BY YOU OR UNDER YOUR SUPERVISION?

A. Yes, the review to which I testify was performed by me or under my supervision.

Q. PLEASE DESCRIBE YOUR REVIEW OF THE COMPANY’S PLANT OPERATIONS.

A. In preparation for this proceeding, ORS examined various fuel and performance documents related to the Company’s electric generation and power plant outage and maintenance activities. ORS analyzed the Company’s monthly fuel reports including power plant performance data, heat rate data, unit outages, and generation statistics. ORS also monitored electric generation statistics through industry and governmental publications.

ORS attended (via virtual participation) the April 13, 2022, Nuclear Regulatory Commission (“NRC”) 2021 Annual Assessment Meeting for the H.B. Robinson Nuclear Plant (“Robinson”) and the April 27, 2022, NRC 2021 Annual Assessment Meeting for both the Shearon Harris Nuclear Plant (“Harris”) and the Brunswick Nuclear Plant (“Brunswick”). Additionally, ORS met virtually with Company personnel from various departments to discuss and review the Company’s electric generation, power plant outages and maintenance activities.

1 **Q. DID ORS EXAMINE THE COMPANY'S PLANT OPERATIONS FOR THE**
2 **ACTUAL PERIOD?**

3 A. Yes. ORS reviewed the performance of the Company's generation units to
4 determine if the Company made reasonable efforts to maximize unit availability and
5 minimize fuel costs. ORS also reviewed the operating statistics of the Company's power
6 plants by unit. Exhibit ORT-1 shows, in percentages, the average availability, average net
7 capacity, and average forced outage factors of the Company's major generation units
8 during the Actual Period. This exhibit also includes the North American Electric Reliability
9 Corporation ("NERC") national five-year (2016-2020) averages for availability, capacity,
10 and forced outage factors for each type of generation plant.

11 **Q. PLEASE EXPLAIN HOW OUTAGES ARE REPRESENTED ON EXHIBITS ORT-**
12 **2 THROUGH ORT-4.**

13 A. Exhibits ORT-2 and ORT-3 summarize outages lasting seven (7) or more days for
14 major coal and natural gas units, respectively, during the Actual Period. While not all plant
15 outages are included in these exhibits, all outages were reviewed. ORS reviewed the
16 outages, including information and data provided by the Company in testimony and
17 discovery, and discussed the outages with Company management. ORS found the outages
18 to be reasonable based on ORS's review of the outage data from the Actual Period,
19 forecasted outage data from Docket No. 2021-1-E, historical outage data from previous
20 annual fuel proceedings, and industry experience.

21 Exhibit ORT-4 shows the duration, type, and cause of each outage for the nuclear
22 units. During the Actual Period, there were two (2) scheduled refueling outages with one
23 requiring an outage extension, two (2) maintenance outages, and three (3) forced outages.

1 ORS reviewed the outages, including information and data provided by the Company in
2 testimony and discovery as well as associated NRC documents, and discussed the outages
3 with Company management. ORS found the outages to be reasonable based on ORS's
4 review of the outage data from the Actual Period, forecasted outage data from Docket No.
5 2021-1-E, historical outage data from previous annual fuel proceedings, and industry
6 experience.

7 **Q. WHAT WERE THE RESULTS OF ORS'S ANALYSIS OF THE COMPANY'S**
8 **POWER PLANT OPERATIONS FOR THE ACTUAL PERIOD?**

9 A. Based on ORS's review of the Company's operation of its generation facilities
10 during the Actual Period, ORS determined that the Company made reasonable efforts to
11 maximize unit availability and minimize fuel costs.

12 **Q. DID ORS REVIEW THE COMPANY'S GENERATION MIX DURING THE**
13 **ACTUAL PERIOD?**

14 A. Yes. Exhibit ORT-5 shows the generation mix for the Actual Period by percentage
15 and generation type. As shown in this exhibit, the Company's nuclear, coal, and natural
16 gas plants comprised, on average, 42.96%, 8.65% and 32.53%, respectively, of the
17 Company's generation throughout the Actual Period. This equates to approximately
18 84.14% of the Company's generation for the Actual Period. The remainder of the
19 generation was met through a mix of renewables (hydroelectric, solar, and
20 biomass/biogas), purchased power, and Joint Dispatch Agreement ("JDA") purchases.

1 **Q. DID ORS EXAMINE THE COMPANY'S FUEL COSTS ON A PLANT-BY-PLANT**
2 **BASIS FOR THE ACTUAL PERIOD?**

3 A. Yes. Exhibit ORT-6 shows the average fuel costs for the major generation plants
4 on the Company's system for the Actual Period and the megawatt-hours ("MWh")
5 produced by those plants. The exhibit shows the lowest average fuel cost of 0.580
6 cents/kilowatt-hour ("kWh") at Brunswick and the highest average fuel cost of 4.828
7 cents/kWh at the Mayo Plant. The Company utilizes economic dispatch which generally
8 requires that the lower cost units be dispatched first.

9 **Q. DID ORS REVIEW THE COMPANY'S FORECASTED POWER PLANT**
10 **OPERATIONS FOR THE ESTIMATED AND FORECASTED PERIODS?**

11 A. Yes. ORS reviewed the Company's maintenance schedules and projected
12 performance data for its power plants for the Estimated and Forecasted Periods. ORS
13 compared these schedules and performance data to previous maintenance schedules and
14 performance data from Docket No. 2021-1-E, maintenance schedules and performance
15 data from the Actual Period, and historical projections from previous annual fuel
16 proceedings. Based on its review, ORS found the Company's maintenance schedules and
17 projected data for its power plants for the Estimated and Forecasted Periods to be
18 reasonable.

19 **Q. DOES ORS RECOMMEND ANY ADJUSTMENTS TO THE FUEL FACTORS**
20 **PROPOSED BY THE COMPANY?**

21 A. No. ORS does not recommend any adjustments to the Fuel Factors based on the
22 Company's power plant operations.

1 **Q. DOES ORS HAVE ANY ADDITIONAL RECOMMENDATIONS REGARDING**
2 **THE COMPANY'S ANNUAL FUEL FILINGS?**

3 A. Yes. Regarding power plant outages not completed as of February 28, 2022, and
4 plant outages where final reports or investigations (Company, contractor, government
5 reports or otherwise) are not available, ORS would request the right to review the
6 reasonableness of plant outage(s) and associated costs in the review period during which
7 the outage is completed or when the report(s) become available.

8 **Q. WILL YOU UPDATE YOUR DIRECT TESTIMONY BASED ON INFORMATION**
9 **THAT BECOMES AVAILABLE?**

10 A. Yes. ORS fully reserves the right to revise its recommendations via supplemental
11 testimony should new information not previously provided by the Company, or other
12 sources, become available.

13 **Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

14 A. Yes, it does.

Office of Regulatory Staff
Power Plant Performance Data
Duke Energy Progress, LLC
Docket No. 2022-1-E

EXHIBIT ORT-1

			<i>Actual Period Data</i>		
Coal Plants	Unit	MW Rating	Average Availability Factor (%)	Average Net Capacity Factor (%)	Average Forced Outage Factor (%)
Mayo	1	704	55.43	15.32	18.52
Roxboro	1	379	69.11	15.50	1.06
Roxboro	2	668	75.41	18.01	7.03
Roxboro	3	694	76.64	39.73	2.72
Roxboro	4	698	50.25	24.56	12.12
Coal Totals		3,143	64.81	23.35	9.09
<i>NERC 5-year average (All Coal Plants)</i>			<i>82.29</i>	<i>49.73</i>	<i>5.26</i>

CC Plants ¹	Unit	MW Rating	Average Availability Factor (%)	Average Net Capacity Factor (%)	Average Forced Outage Factor (%)
Lee	CC1	888	76.65	63.28	2.91
Richmond	CC4	475	71.86	59.78	0.27
Richmond	CC5	608	83.33	69.02	0.60
Sutton	CC1	607	82.90	66.09	0.92
Asheville	CC1	238	80.98	65.85	1.02
Asheville	CC2	238	85.17	79.32	0.47
CC Totals		3,054	79.41	65.83	1.31
<i>NERC 5-year average (CC Plants)</i>			<i>88.04</i>	<i>54.25</i>	<i>2.36</i>

Nuclear Plants	Unit	MW Rating	Average Availability Factor (%)	Average Net Capacity Factor (%)	Average Forced Outage Factor (%)
Brunswick	1	938	96.43	97.35	3.57
Brunswick	2	932	89.92	88.07	1.81
Harris	1	964	93.36	94.66	0.15
Robinson	2	759	95.83	96.73	4.17
Nuclear Totals		3,593	93.88	94.09	2.42
<i>NERC 5-year average (All Nuclear Plants)</i>			<i>92.72</i>	<i>91.71</i>	<i>1.63</i>

¹ CC designates Combined-Cycle units

Office of Regulatory Staff
Coal Unit Outages - 7 Days or Greater Duration
Duke Energy Progress, LLC
Docket No. 2022-1-E

EXHIBIT ORT-2

Unit	Date Offline	Date Online	Hours	Outage Type	Explanation of Outage
Mayo 1 ¹	2/27/2021	3/13/2021	335.97	Planned	Unit taken offline for planned outage.
Mayo 1	3/13/2021	3/27/2021	337.00	Planned	Extension of planned outage.
Mayo 1	3/27/2021	5/2/2021	874.42	Maintenance	Unit taken offline due to switch work being performed by Transmission
Mayo 1	6/19/2021	6/30/2021	259.28	Planned	Unit taken offline for planned repair.
Mayo 1	10/4/2021	10/16/2021	282.00	Maintenance	Unit taken offline due to maintenance of the SCR's on both boilers.
Mayo 1	10/16/2021	11/20/2021	841.00	Planned	Unit taken offline to perform planned inspections and repairs.
Mayo 1	1/8/2022	1/19/2022	269.62	Forced	Unit forced offline due to piping to the condenser having hole in the line.
Roxboro 1	8/15/2021	8/24/2021	226.98	Maintenance	Unit taken offline due to tube leak repair.
Roxboro 1	10/5/2021	10/23/2021	418.63	Maintenance	Unit taken offline due to Hot Air Duct Expansion Joint Repairs.
Roxboro 1	10/23/2021	12/20/2021	1,393.00	Planned	Unit taken offline for planned outage.
Roxboro 2	5/26/2021	6/5/2021	246.12	Forced	Unit forced offline due to tube leak repair.
Roxboro 2	9/4/2021	10/12/2021	916.38	Planned	Unit taken offline for planned outage.
Roxboro 3 ¹	2/21/2021	3/3/2021	235.30	Maintenance	Unit taken offline to clean 3A & 3B SCR's
Roxboro 3	9/29/2021	10/11/2021	276.00	Maintenance	Unit taken offline for Transformer Repairs.
Roxboro 3	10/11/2021	11/3/2021	552.00	Planned	Unit taken offline for planned outage.
Roxboro 3	11/3/2021	11/24/2021	505.00	Planned	Extension of planned outage.
Roxboro 4	11/27/2021	12/18/2021	525.00	Planned	Unit taken offline for planned outage.
Roxboro 4	2/3/2022	2/10/2022	173.00	Maintenance	Unit taken offline due to Switchyard Repairs.

¹ This outage began prior to the Actual Period.

Office of Regulatory Staff
Natural Gas Unit Outages - 7 Days or Greater Duration
Duke Energy Progress, LLC
Docket No. 2022-1-E

EXHIBIT ORT-3

Unit	Date Offline	Date Online	Hours	Outage Type	Explanation of Outage
Asheville CC1	4/16/2021	5/23/2021	886.65	Planned	Unit taken offline for planned outage.
Asheville CC1	10/21/2021	11/1/2021	240.03	Maintenance	Unit taken offline for Effusion Plate Inspection.
Asheville CC1	1/25/2022	2/4/2022	242.65	Forced	Unit forced offline due to hydraulic oil o-ring failure
Asheville CC2	9/23/2021	10/8/2021	356.10	Planned	Unit taken offline for planned outage.
Lee CC	3/10/2021	5/16/2021	1,608.05	Planned	Unit taken offline for planned outage.
Richmond CC4	3/6/2021	3/15/2021	215.93	Planned	Unit taken offline for planned Spring outage.
Richmond CC4	9/10/2021	11/14/2021	1,579.55	Planned	Unit taken offline for planned Fall outage.
Richmond CC5	11/13/2021	11/24/2021	266.50	Planned	Unit taken offline to repair actuator leak
Richmond CC5	12/11/2021	12/19/2021	213.13	Maintenance	Unit taken offline for repair
Sutton CC	5/7/2021	5/29/2021	527.05	Planned	Unit taken offline for planned Spring outage.
Sutton CC	10/1/2021	10/8/2021	167.93	Planned	Unit taken offline for planned Fall outage.

Office of Regulatory Staff
Nuclear Unit Outages
Duke Energy Progress, LLC
Docket No. 2022-1-E

EXHIBIT ORT-4

Unit	Date Offline	Date Online	Hours	Outage Type	Explanation of Outage
Brunswick 2	3/5/2021	4/5/2021	725.77	Planned	Unit taken offline for planned refueling outage
Harris 1	4/24/2021	5/14/2021	489.13	Planned	Unit taken offline for planned refueling outage
Brunswick 1	5/1/2021	5/13/2021	287.68	Maintenance	Unit taken offline to replace reactor recirculation pump seals
Harris 1	5/14/2021	5/15/2021	13.17	Extension	Extension of refueling outage to repair vibrating bracket
Harris 1	6/5/2021	6/8/2021	79.75	Maintenance	Unit taken offline due to Transformer Maintenance
Robinson 2	10/18/2021	11/2/2021	365.13	Forced	Unit forced offline due to reactor coolant pump (RCP) leakage
Brunswick 1	12/19/2021	12/20/2021	24.98	Forced	Unit forced offline to repair main generator phase B, No Load Disconnect Switch
Brunswick 2	1/28/2022	2/4/2022	158.60	Forced	Unit forced offline to repair condenseer leakage

Office of Regulatory Staff
Generation Mix (Percentage)
Duke Energy Progress, LLC
Docket No. 2022-1-E

EXHIBIT ORT-5

	2021										2022		Average ¹
	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	
Nuclear	44.80%	48.83%	39.36%	39.71%	38.13%	37.77%	45.72%	46.80%	48.85%	47.77%	38.32%	39.42%	42.96%
Coal	6.05%	1.71%	8.75%	15.93%	15.61%	13.85%	9.41%	4.12%	0.93%	3.16%	15.26%	8.96%	8.65%
Natural Gas	32.69%	27.16%	26.88%	30.59%	32.15%	32.61%	29.87%	31.87%	36.83%	36.51%	35.05%	38.12%	32.53%
Hydroelectric	2.00%	1.83%	1.22%	0.64%	0.50%	0.66%	0.64%	0.72%	0.52%	0.44%	0.92%	1.22%	0.94%
Solar	0.41%	0.60%	0.52%	0.37%	0.35%	0.33%	0.41%	0.38%	0.37%	0.27%	0.20%	0.28%	0.37%
Wind	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Biomass/Biogas²	0.03%	0.03%	0.04%	0.02%	0.01%	0.01%	0.01%	0.02%	0.01%	0.01%	0.01%	0.01%	0.02%
Purchased Power	9.49%	16.99%	18.17%	12.43%	12.77%	14.15%	13.20%	15.23%	11.45%	11.02%	7.60%	11.17%	12.81%
JDA Purchases	4.53%	2.85%	5.06%	0.30%	0.48%	0.63%	0.75%	0.85%	1.04%	0.81%	2.65%	0.83%	1.73%

¹ Average total may not equal 100% due to rounding.

² Biogas is burned at DEP's Combined Cycle Units. The values shown above for Combined Cycle Units exclude the Biogas component.

Office of Regulatory Staff
Generation Statistics for Plants
Duke Energy Progress, LLC
Docket No. 2022-1-E

EXHIBIT ORT-6

Plant	Fuel Type	Average Fuel Cost (Cents/kWh) ¹	Generation (MWh)
Brunswick	Nuclear	0.580	15,189,680
Robinson	Nuclear	0.596	6,431,487
Harris	Nuclear	0.611	7,993,560
Lee CC	Natural Gas	1.993	11,924,802
Richmond CC	Natural Gas	3.523	7,102,191
Roxboro	Coal	3.654	5,536,874
Asheville CC	Natural Gas	3.853	3,563,917
Sutton CC	Natural Gas	4.313	4,162,539
Mayo	Coal	4.828	956,682

¹ Includes Base Fuel and Environmental Costs.